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The Dissatisfaction of Workers over Wage Inequities, the Extension of Wage Negotiations in Collective Bargaining, and Government Measures for Regulation of Wages have Led an Increasing Number of Companies to Rationalize their Wage Structures.

Job Evaluation *in* A Paper Plant

By Eugene J. Benge
Chicago, Ill.

"Around here they never pay any attention to rates," said one worker to another as they were leaving the plant at the close of a working day. "It burns me up about that big lug who was transferred from the Inspection Department to our department. He don't turn out near as much as I do, yet he gets 96 cents an hour."

"Yeah, you're right," rejoined the other. "It took me four years to get the skill to do my job, yet I know a fellow that came with the company three months ago over in the Shipping Department and he started for as much as I get now. The foreman there always did pay big. My foreman's a tightwad."

Pressing Problem Today

Such conversations can be heard in the vicinity of many plants, more often, probably, than most executives suspect. Employees feel intuitively that there should be some logical basis for difference in rates,—some guiding justice to preside over the wage scale.

Executives are faced with the problem of developing a defensible method to measure the relative values of jobs so that the rate for each one will be in proper relation to the others, taking into consideration the differences in mental, skill and physical requirements; the responsibilities; and the working conditions applying to each job.

To ignore this problem paves the way for serious dissatisfaction. Employees may falsely read into management's failure to solve the wage problem, a disinterest

in all employee problems. A very few rate inequalities may be sufficient to start serious trouble. Even where discontent has not yet crystallized into action, it can scarcely be expected that a group of dissatisfied workers will be highly efficient.

On the other hand, a company which bases its wage rates on a careful study of the requirements of each job demonstrates both leadership and impartiality. "They sure do try to be fair to everybody," is the expression heard as the employees leave that plant.

Although the effect of job evaluation on employee morale is most stressed these days, the effect on the stability of unit labor costs is not to be ignored. Moreover, substantial savings sometimes result from the studies of basic work incident to job analyses.

The development of a satisfactory method for measuring job values is a pressing problem facing many executives today. To be satisfactory, a plan must be equitable, applicable to local conditions and understandable to employees. It is highly desirable that it permit comparisons of job requirements and rates as directly as possible—not through the use of some indirect valuation terms familiar only to experts.

A certain mid-western manufacturer of paper specialties felt the need for a satisfactory plan to measure the relative values of jobs. Management first experimented with a point system, but it proved to be poorly suited to the particular situation. Finally, this company used, with satisfaction, the factor comparison method described here.

Job Analysis First Step

THE first step was to make a careful analysis of each distinct job in the plant. The analysts interviewed the employees at their work stations, recording in detail the education and trade knowledge required; the kind of skill involved and the time necessary to acquire it; kinds and amounts of physical effort; responsibility for machinery, materials or the work of others; and the conditions under which the employee was required to work.

The interviewer's approach was friendly and the contact pleasant. The employee saw the notes the analyst made, had opportunity to amend them, and to call attention to anything he considered important about his job. The employee was always thanked for his cooperation.

In the second stage of the work, the analyst developed a job specification for each job studied. The specification (See Figure 1) presented a concise description of the job duties, and pertinent information classified according to the five comparison factors:

1. Mental Requirements
2. Skill Requirements
3. Physical Requirements
4. Responsibilities
5. Working Conditions

FIGURE 1

JOB SPECIFICATION

JOB TITLE_____ DEPT._____ DIV'N._____ NORMAL FORCE_____

DUTIES:

DATE **PROMOTE FROM**

Mental Effort	Skill	Physical Effort	Responsibility	Working Conditions
—years' gen'l educ'n. Kind of special educ'n:	Kind:	Kinds:	Kind of equipment:	Place: Type:
Kind of work knowledge:			Kind of tools:	Surroundings:
			Kinds of materials:	
		Operation: —Repetitive —Varied —Intermitt. —Semi-auto. Age limits——— to ———		Atmosphere:
Mathematics used	—Dexterity	Minimum height——————— Minimum weight———————	Kind of property:	Illumination:
—Reads orders	Inexper-time to learn:	Sex—M— or F— Color—W— or B—	For savings—how:	
—Prepares records:	Desirable prior exper.:	—Much fatigue —Very active work —Great strength		Hazards:
—Instructs others —Rec. constant sup'v'n.		—Good eyesight —Color discrimination	For work of others:	
—Monotony —Distractions	Precision or work limits	Other physical factors:	For employee contact:	Other:
Pers. Qualities Needed: —High Intelligence —Patience —	Co. jobs which train for		Other responsibility:	

REMARKS:

Symbols—X to indicate; XX to stress; P—prepared; R—required, or show percentage or amount.

PREPARED BY_____ **APPROVED**_____

Supervisors approved all job specifications before they were used in evaluation work.

To get an idea of the relative skill required for two jobs one needed but to place the skill columns of two specifications side by side for comparison, a very easy thing to do. Similarly, comparisons of jobs could be made according to any of the other factors. However, it would be a very cumbersome task to compare all jobs, two at a time, by each factor. Hence, as is customary under the factor comparison method of job evaluation, a key job comparison scale was prepared.

Another reason for the key job comparison scale is that some method of applying *wage rates* to job relativities is needed. Mere comparisons among jobs would not indicate the values of particular amounts of responsibility, or of skill, or of physical effort, etc.

Key Jobs Compared

In making such a comparison scale, the problem is to select a few representative jobs which are in proper relation to the average of all and to appraise each factor of each selected job. Other jobs can then be compared, one factor at a time, against this scale (see Figure 2).

Committee of Five Set Up

Some jobs obviously were unsuited for possible inclusion in such a scale. After considerable analysis and discussion, some twenty-five were selected as possible key jobs. A committee of five, consisting of two department heads, a rate engineer, a time study engineer, and a consulting management engineer then proceeded to rank these twenty-five jobs, first, as to mental effort, secondly as to skill, then as to physical effort, responsibility and working conditions, putting in first rank the one of the twenty-five jobs which in their judgments required the greatest degree of the factor under consideration. The rankings of the different committee members were averaged, after comparisons had been made and members had been given opportunity to change their rankings following discussion.

After average rankings had been computed, each member of the committee determined what portion of the present rate for each job he considered was being paid for each factor. Thus, for a common labor job which is being paid at the rate of 40¢ per hour, a member might make an apportionment as follows:

Mental effort	.04
Skill	.05
Physical effort	.20
Responsibility	.03
Working conditions	.08
Total	.40

The ratings of the members for each factor were then averaged.

Symbols—R to indicate
R—required, or show percentage or amount.

FIGURE 2. Factor Comparison Scale

cts.	MENTAL REQUIREMENTS	SKILL	PHYSICAL REQUIREMENTS	RESPONSIBILITIES	WORKING CONDITIONS	cts.
31						31
30						30
29				Tour Boss		29
28	Tour Boss					28
27				S. Dept. Fmn.		27
26	S. Dept. Fmn.					26
25		Tour Boss				25
24						24
23		S. Dept. Fmn.				23
22				P. Mch. Tender		22
21		P. Mch. Tender				21
20	P. Mch. Tender	D. Mch. Setup Man				20
19						19
18	D. Mch. Setup M.	SN Setup Man		D. Mch. Setup M.		18
17			P. M. Laborer			17
16	SN Setup Man	D. Mch. Operator				16
15	D. Mch. Operator		Tour Boss	SN Setup Man	P. M. Laborer	15
14			C. Mch. Feeder	C. Box Inspect.		14
13		C. Box Inspect.	P. Mch. Tender	D. Mch. Operator	Tour Boss	13
12	C. Box Inspect.		D. Mch. Operator		P. Mch. Tender	12
11		Env. Inspector	D. Mch. Setup Man	Env. Inspector	C. Mch. Feeder	11
10	Env. Inspect.	C. Mch. Feeder	SN Setup Man		D. Mch. Operator	10
9			Env. Inspector		D. Mch. Setup Man	9
8	C. Mch. Feeder		S. Dept. Fmn.	C. Mch. Feeder	SN Setup Man	8
7		P. M. Laborer	C. Box Inspect.		Env. Inspect.	7
6					S. Dept. Fmn.	6
5	P. M. Laborer			P. M. Laborer	C. Box Inspect.	5
4						4
3						3
2						2
1						1

Next, comparison was made between the position of a job in each factor on the ranking sheet and the position of the same job in each factor on the money value apportionment. Obviously, the job which ranked highest in skill should also be the job for which the committee apportioned the highest money value for skill, the one which ranked second should be the one to which the second highest amount

of money was apportioned, and the one which ranked lowest should also be lowest in money value for that factor.

However, it was found that some jobs carried rates too large to permit a spread which would place them in proper rank,—others were being paid too little. Jobs with rates which resulted in the greatest discrepancies between factor rank and rating were eliminated and the process was repeated with the remaining ones. At last ten jobs remained, each of them with factor money values corresponding to its rank positions for the five factors. These ten were listed on the job factor comparison scale in the style shown in Figure 2. This scale became the measuring stick by means of which the different factors in all other jobs were evaluated.

Putting the Valve on Jobs

THE work of evaluation was done by committees consisting of the rate engineer, the time study engineer, a consulting management engineer, the foreman of the department concerned and an hourly rated employee who was selected by the employees. The three engineers sat on all committees.

To evaluate a job, each member of the committee was given a copy of the scale and specifications for all the jobs on it, together with specifications for the jobs to be rated. After reading the entire specification of a job to be rated, the member concentrated his attention on the items in the mental effort column. He considered whether the mental requirements were equal to, greater than, or less than those of a tour boss, 5 department foreman, paper machine tender, D machine operator or other job on the scale. He might decide that the mental requirements were greater than those of the D. machine set-up man and, therefore, he would rate the job at 19¢ for mental effort.

From five to ten jobs were rated in each factor before consideration was given to the other factors. Skill, Physical Effort, Responsibility, and Working Conditions were rated in the same manner as Mental Effort. Each member submitted his rating for entry on a blackboard. He was given opportunity to explain reasons for his rating, and to change his rating if discussion showed him that he should. The ratings of the five members were finally averaged for each factor, and the five averages totaled to get the evaluated rate for the job.

The evaluated rate might be higher than, equal to, or lower than the present rate. Theoretically, there should be about as many jobs which evaluate higher than current rates as those which evaluate lower. Actually, it was found that the average of all rates after evaluation, varied only a fraction of one per cent from the average before the evaluation work was done.

Adjusting Pay Rates

THE company decided to give immediate effect to all increases. Employees already receiving more than the evaluated rates for their jobs were to continue at the higher rates until normal labor turnover, transfers, and promotions gradually

took care of the situation. Evaluated rates which were lower than current rates were to be effective as to new employees, or to those transferred from other jobs. No employee was made to suffer a decrease in earnings as a result of the job evaluation. This policy resulted in a small immediate increase in payroll, most of which should be eliminated in the course of two or three years. The management believed that the employee good will, which would result from such a policy, would more than warrant the small temporary increase in the payroll.

Results Secured

THE results of the job evaluation work secured by this manufacturer can be summarized as follows:

1. Stabilized labor costs. By avoiding the repeated pressure of employees for rate increases, the company not only avoids higher labor costs, but it also avoids the discontent incident to an unsystematized method of rate handling.

2. Job descriptions. These can be used for improvement of selection, for building specific training programs, and for the compilation of practical pre-employment tests.

3. An evaluation scale. This consists of the key jobs analyzed by factors as shown in Figure 2, and may be used to settle any rate disputes and to establish hourly rates for new jobs. It will also be used to establish base hourly rates for piece work jobs.

4. Satisfied employees. Employees have the satisfaction which grows out of knowledge of how the work was done, that some of their own number sat in the deliberations, and had as much part in setting the rates as did anyone of the other members of the evaluation committees. They feel that each job has been carefully considered and compared with the key jobs in a way that assures fairness to all.

Which is Most Significant? Conclusive Answers to Specific Questions about Wage Setting, etc., or a Development in the Understanding of Human Situations which Would Help to Improve Relations and to Resolve the Problems Arising in Them?

Psychology *and* Management

By Wallace H. Wulfeck
The Psychological Corporation,
New York, N. Y.

In a recent monograph "Propaganda for Democracy," Paul Garrett of General Motors points out that "The times in which we live might well be called days of *The Great Indecision*. Never have so many emotional currents tugged at mass sympathies, or so many tides in conflict been loosed to sweep away judgments. Never have there been such deliberate pressures upon individuals and groups of individuals."

Management needs no prophet to tell it that technological problems, while they still exist, are secondary. The primary problem of industry, politics and world economy is a problem of human relations. Moreover, industry and management need no seer to point out the fact that the behavior of man is the nub of the matter.

Are there Laws of Behavior?

What are the psychological foundations of management? They must be the laws of human behavior. They are found, in the dynamics, the energies and the satisfactions of the workers who comprise an organization, and the satisfaction of the public served by that organization.

(By workers is meant all employees whose cooperation is necessary to a successful operation, including the executives themselves. By the public we mean actual and potential customers, actual and potential stockholders, actual and potential voters, and any one whose goodwill might help or whose ill-will might harm a company.)

The staff of an army can enforce cooperation on the grounds of patriotism and

discipline. The management of a business, in a democracy at least, can only develop cooperation on the basis of the satisfactions it gives to the workers and the public.

Whatever the field of management, whether in private business or in public institutions, the satisfactions of people are the final criterion of successful management.

Many Answers not Clear

WHAT are the laws of behavior? What are the factors that energize and satisfy people? Can satisfactions be described in terms of wages? Profits? Recognition and honor? Ownership? Security or opportunity? Profit-sharing? Union membership? Shorter hours? Less strenuous work? Or in any combination of these elements?

In short, why do men behave like human beings? What are the incentives which motivate individuals in one direction or another? What is personality and character? What are the dynamics of human energies?

The answers to these questions are not clear. Certainly industry or organized labor has no answers yet. An amusing instance of labor's "amazing" techniques occurred a few weeks ago in an Eastern City. A contractor in erecting a building needed a winch. He had his carpenters build a drum and a projecting boom and proceeded to hire a man and his horse to rotate the boom. Thus the man spent his day driving his horse around a well beaten circular path. After a while a union official discovered that the man was not a member of any union and insisted he join one at once. That raised a nice question—What union should he join?

Hire the Horse

WASN'T he hoisting? Obviously he should join the hoisting engineers union. So he tried. But the hoisting engineers would have none of him. To them he was a teamster. But the teamsters wouldn't have him because he wasn't hauling anything. Since the unions were unable to make up their minds, the contractor put him back to work and the unions called a strike. After a week of "arbitration" they found a solution: Fire the man—hire the horse. He just hung around to look after the animal.

Liserson of N.L.R.B. has pointed out the unrealistic approach of labor to its own human problems. The story is a nice example of the method of resolving a dilemma by indirection without due regard for the human elements involved. On the other side, some industry has gone much further in seriously attempting to work at the job (leaving for the moment the question of motives). But the combined efforts of industry have been too few and superficial to do little more than scratch the surface. They have been common sense rather than scientific.

Despite much glib talk to the contrary, the great superstition of our mechanical civilization has been, and still is, the belief that human nature is beyond scientific

analysis. Medicine, biology, and chemistry may analyze the body as a machine. A scientist like Carrel can write a book on "Man the Unknown," largely because the physical sciences have dismembered man almost beyond recognition. But we have not yet conceded the powers of scientific psychology to study man as a whole, coordinated, functioning personality.

What are the results? One of the most obvious is this: While denying the possibilities of a science of man, almost every manager regards himself an authority on human nature. Managers who consider themselves ignorant of the dynamics of machines nevertheless consider themselves, with no more scientific study, authorities on the dynamics of the emotions of man. The result has been a continuous conflict of personal opinions, and the triumph of might rather than right, of expediency rather than truth.

Barter Psychology

Even engineers who are keen to use scientific methods in thinking about materials, often abandon all semblance of science when thinking about people. We frequently hear executives stating broad conclusions about human psychology as a result of a few conversations with taxi drivers, or with men in the smokers, or with their bootblacks, or their barber. "My wife and her friends tell me," is one of the most common grounds for conclusions of great moment.

Through this type of thinking, management has helped to create many of the very problems which now seem almost insoluble. Management has defined human nature by intuition, by edict, by opinion, but mostly by introspection. Because managers are men, they reason that knowing all about themselves (a very doubtful assumption by the way) they know all there is to be known about all other men. All this in the absence of adequate research on which to base its conclusions. Sometimes, in the belief that a scientific method was being used, an executive has found himself doing crystal gazing into an eight ball.

Questions about Management Policies

Consider, for example, some of the ways management has helped to create increasingly complex human situations.

1. *Social Security*. The managements of industry, especially of large corporations, have been largely responsible for the American version of social security, now so popular. Through group insurance, through pension plans, sick benefits and profit sharing plans, management has for years been trying to guard against the vicissitudes of unemployment and the needs of old age. Was management correct in its conception of social security? Is it possible that security can be destructive rather than constructive? Is security a tonic that personality needs or a poison which undermines personality and therefore society at large?

2. *Unionism*. Management has often resisted *unionism*. Is *unionism* an inevi-

table and lasting social expression of human nature which should not be resisted, or is it a social phenomenon of specific but temporary significance? Is it a cultural necessity or only a useful expedient? Conflicting personal opinions and often force now settle this question, without adequate knowledge or research to guide decisions.

3. *The Salaries of Important Executives.* Does the public resentment aroused by high salaries represent a true measure of the value placed by the public on the services of management? In what terms and upon what terms do most people evaluate industrial leadership?

4. *Education.* Industry and managers of industry are largely responsible for the financing and often the development of education, especially the higher forms of education. Does this education reflect a sound conception of human nature? The studies of many psychologists lead to the conclusion that it does not. But, before any final answers are given, the problems must be submitted to exhaustive investigation. What kind of education can management or should management support?

5. *Elementary Economics.* Management has come to the conclusion that workers and the public should be educated in the elementary facts of economics. If our elaborate plan for free education has not already done this, what hope is there in the efforts of management unless conceived on a sounder concept of human nature than that of the schools?

More Psychological Research Needed

PUBLIC RELATIONS. The current panacea of a Public Relations program, and a Director of Public Relations, reflects the need for more research into the psychology of human relationships. Public relations activities can do no more than reflect private relations. The mere appointment of a public relations counsel or director is no solution for the problems of public relations.

It may be, however, a step in the direction of acknowledging the need for specialized research into the dynamics of human relationships. It may be a step toward the discovery of public relations in terms of its living elements, namely, the attitude of every manager toward his subordinates, of every supervisor toward his workers, of every worker toward the public.

These are but a few of the fields in which decisions have been and are being made in the absence of adequate research to guide them.

Dr. Frank B. Jewett Quoted

DR. FRANK B. JEWETT, President of the Bell Telephone Laboratories, discussing "Research in Industry" points out that: "The principal thing which distinguishes the world of the past one hundred fifty years from the ages of human history which preceded has been the wide-spread acceptance of the so-called scientific method as the best, most powerful and most expeditious means of exploring the unknown, and the results that have followed that acceptance. Fundamentally it

is nothing but an idea—the concept that the surest way to test a hypothesis is to subject it to a succession of simple controlled experiments, each of which can be repeated at will, and to be guided rigorously by the result. To be successful its votaries must observe strict intellectual honesty. Recent history shows that in this concept man has hit upon one of the most, if not the most powerful tools for change ever created."

But nowhere in his brilliant presentation does he so much as infer that the scientific method can and should be applied to *men* in industry.

Scientific psychology (not psychoanalysis or psychiatry which are separate clinical disciplines), those men who, by the application of the scientific method, are developing a science of man has made surprising progress in two directions. On the one hand it has developed certain empirical, i.e. observed, laws of individual human behavior, and methods for controlled study of the individual. On the other hand, it has devised new and important methods for the study and prediction of group behavior, attitudes and opinions.

The unfortunate part of the progress has been that the work has largely been confined to the college laboratories, with few resources and little encouragement to push it.

Men Who Have Applied Psychology

Only a few men have had the courage and conviction to apply these new techniques to the problems of industry and politics. Among them, such men as Henry C. Link, George Gallup, Walter V. Bingham, Elton Mayo, Charles S. Slocombe and Elliot Dunlap Smith.

Scientific men devoted to "pure science" have always looked with suspicion upon the "applied worker," while industry has felt the psychologist "professor" knew little or nothing about the point of view and problems of management and industry.

For the most part, the last accusation is true. But, the complete ignorance of industry of a mature psychologist, at the time when he might begin to tackle an industrial problem, does not militate against his usefulness to industry.

For he brings to the solution of say, a labor relations problem, a knowledge of quite a few laws of human behavior, which apply to all humans, whether in factories or the wilds of darkest Africa. The industrial men, with whom he works in the solution of the problem, can supply all the necessary industrial information.

How Problems Are Solved

It is the addition of the psychologists knowledge, to that of the industrial men, which can bring about the solution of problems, which industrialists alone have so far been unable to solve.

Moreover, management, while it has shown some impatience at the time-

consuming application of the scientific method to physical research, has often been downright intolerant of the time and money necessary to do the same thing in human research.

It is unfortunate, for both industry and psychology, that the psychologist in industry has largely been restricted to the job of developing tools and programs for the selection and placement of personnel. Perhaps it has been the psychologist's fault that he has not had opportunity to work in the wider areas of industrial interaction. In so far as it has been his fault he has failed to serve both men and management and has been a traitor to his science.

Psychology is a recent science, but there is a growing number of executives whose minds are open to the possibilities of psychological research, who encourage and initiate such research, who coordinate its results, and who act as the ambassadors of such research to the other members of their organization. It is through such men, and their appreciation of the possibilities of applying psychological principles to practical problems, that the foundations of management will come to be better understood.

Contrasts Old and New Views

These executives are quite different from those industrial giants of the past who, by sheer conviction and power, established their personal philosophies of management with conspicuous success. These giants were bent on proving their own beliefs about human nature and did temporarily. The executives I speak of as modern executives are interested in discovering those forces which will enable their fellow executives, and management generally, to build on the enduring elements in human nature, for the benefit of society at large.

These are the executives to whom psychology must look for encouragement and for guidance, if our civilization is to bring to fruition its promising contributions to the understanding of human nature.

Good Lighting Involves, the Proper Amount and its Proper Distribution to Ensure Absence of Glare, Troublesome Shadows and Dark Surroundings. Good Vision Involves Good Lighting, Adjustable to the Work and the Individual, and Correction of Eye Defects.

Work *and* Its Illumination I

By C. E. Ferree and G. Rand

Research Laboratory of Physiological Optics, Baltimore, Md.

We have conducted experiments and research for more than twenty-five years on the best working conditions for the eye. Results of these researches have been printed in various papers, more than seventy-five in all. It is our purpose in this paper to bring together briefly in an easily comprehended and conveniently accessible form some of our more important and practically significant results and conclusions.

Important conditions for the safe and comfortable use of the eye include those pertaining both to work and to its illumination.

Illumination of Work

With respect to the illumination of work we have found the best conditions to be given by daylight or artificial light, closely approximating daylight, in color and composition, and as closely as possible in diffuseness. Other topics to be considered are: distribution or placement of light and brightness, intensity of light, relation between intensity of light and strength of reading glasses, glare, evenness of illumination and the mixture of artificial light and daylight.

Color and Composition of Light

Many of the so-called artificial daylights are of more harm than benefit to the eye. In the selection of an artificial daylight great care should be taken that the light obtained has a proportion of wave-lengths, well balanced with respect to the welfare and comfort of the eye, such as is found in natural daylight. A close ap-

proximation to natural daylight in this respect is Mazda light filtered through the two types of glass furnished by the Macbeth Daylighting Company—Daylight and Whiterlite. Not every blue glass can be used to advantage as a filter for Mazda light.

On examination with the spectrophotometer the blue bulb of commerce shows an excess of light in the region of the green in the spectrum. Also, the glass used in making this bulb is not carefully standardized; that is, it is variable in its filtering properties. Tests made by us for ocular fatigue and discomfort with this lamp gave poorer results than those made with unfiltered Mazda light.[1] Such tests, so far as we know, have not as yet been made with various synthetic daylights.

Maximum Visibility in Daylight

DAYLIGHT, too, because it best brings out the natural brightness and color difference between objects gives to the eye its highest power to discriminate between objects and between objects and their background; in other words, it gives to objects their maximum visibility. This is particularly true for the discrimination of black on white, the task presented by reading the ordinary printed or written page. The light selected for the illumination of the work, if not daylight, should be as free as possible from color and should approximate daylight as closely as possible in composition. Of the colored lights, when equalized in brightness and saturation, we have found by tests of visibility, speed of discrimination, power to sustain clear seeing, and tendency to produce ocular fatigue and discomfort, that the best results in all these respects are given by yellow.[1, 2] The tests were made with both mixed and spectrum lights. It should be clearly borne in mind, however, that light unbalanced toward any color when used to illuminate the work is a detriment, not a help to the eye.

In case of some eyes even the amount of color present in Mazda light is fatiguing and uncomfortable to the extent of rendering night work practically impossible. In these cases we have found that Mazda light, properly corrected for color and properly diffused, has restored the possibility of night work, and has been almost if not quite as comfortable as daylight. In most eyes this extreme intolerance for colored light is not present at medium intensities. In all eyes, so far as we know, a clearly marked intolerance for colored light becomes manifest at the higher intensities in the form of an increased susceptibility to glare.

Diffuseness of Light

DIFFUSENESS of light is very important to satisfactory visibility. That is, if the light is not well diffused all points in the object are not adequately illuminated, and so cannot be clearly represented in the image that is formed on the retina. Perhaps the most important difference in the illumination given by daylight and artificial light is in the diffuseness of the light. The high diffuseness of daylight gives to

objects much greater visibility, and has much less tendency to produce glare. The superior illuminating value of north skylight has long been recognized. Its whiteness and maximal diffuseness give to objects high visibility and their natural color and brightness difference. Its comforting softness is also due to its high degree of diffuseness, consequent freedom from glare and to its tempered intensity. In the production of illumination effects lighting experts have been slow to recognize the full significance of diffusion, and to put into practice all that can be accomplished by the use of adequate diffusing means. In fact in the present race for high intensities adequate diffuseness of light is being more and more overlooked and sacrificed. On both counts, the use of excessive intensities and poor diffusion of light, great harm is being done to the eye.

Distribution of Light and Brightness

One of the most potent causes of eye discomfort and eye fatigue is the presence of high brightnesses in the field of view.[3] High brightnesses are most often due to the light source, the lighting fixture and the immediate surroundings. In the lighting of a room high brightnesses need never be and should never be tolerated. In addition, however, to the elimination of high brightnesses there is the further important question of the optimum placement of medium and lower brightnesses. This is still an outstanding problem even in modern lighting.

The problem of the placement of light and brightness has been created with the devising of lamp shades for shielding the eye from glare, and later giving these shades a reflecting lining to conserve and direct the light. When the opening of the reflector is turned down (direct lighting), the light is directed towards the plane of work, and the walls and ceiling are left dark or very poorly illuminated. On the other hand, when it is turned up (indirect lighting), the light is directed to the ceiling, and from there reflected to other parts of the room.

This results in a disproportionately high brightness of ceiling, and a correspondingly low intensity of light on the plane of work. Relief from the glare of the opening is obtained at the cost of a bad and inefficient placement of the light. As a compromise between these extremes in the placement of light, recourse is made to inverted translucent bowls or housings, which reflect part of the light to the ceiling, and transmit part laterally and downward (semi-indirect lighting), to opaque housings and reflectors, which direct part of the light upward and allow part to pass downward (direct-indirect lighting), and to diffusing globes. While these units give a better placement of light than either totally direct or totally indirect units, the protection afforded against glare is far from adequate.

The next step in the development of lighting fixtures has been the use of baffles, in such a way as to give the minimum of interference to the distribution of light from the source, and the maximum of protection against glare. Glare baffles, as originally devised and described by us, may be defined as a plurality of non-

reflecting light shades of suitable size and shape, having themselves a negligible brightness, which are so worked into the design of the fixture, or housing of the source of light, as to completely shield the eye from the glare of the lamp itself, and all auxiliary reflecting surfaces and, in case of general illumination, to give such wide and uniform distribution of light as to eliminate entirely all high and uneven brightnesses on walls and ceiling. This development has been discussed in former papers.[4] With the use of these baffles in connection with a direct-indirect type of unit and in other ways, it is possible to improve the placement of light and brightness and at the same time completely shield the eye from glare.

Best Place for Light

In our judgment and experience the most favorable placement of light and brightness is to have the maximum on the plane of work, and with respect to walls and ceiling, at least in rooms of moderate height, to have it near the level of the eyes of the worker, with an even and gradual decrease upwards and downwards, thus giving the upper walls and ceiling, for example, less than maximal brightness. The use of baffles makes it more nearly possible to design fixtures that will accomplish this effect.

An important feature in the further development of lighting is a provision in the unit itself of a means for varying placement of light to suit the needs of the individual situation. One of the difficulties in securing good lighting effects, at present, is the lack of flexibility and variety in respect to placement of light. The units of stock or standard type differ rather widely among themselves in this respect.

Thus it is somewhat difficult to adapt the units, that are available to such situations as are presented by different sizes and shapes of room, heights of ceiling, characteristics of walls and ceiling with respect to contour and surfacing, purposes for which the room or enclosure are to be used, etc.

This difficulty is sometimes met by using units of special design and more than one type, located to give the placement of light and brightness desired. It would seem that the better way would be, as indicated above, to provide in the unit itself means for varying the placement of light. Such units have been devised by us for both general and local lighting. As yet none of these has been described with the exception of one of those devised for local lighting.[5]

In connection with the distribution and placement of light and brightness it may be noted that light or illumination carries the idea of affecting visibility, while brightness carries the idea of glare, particularly harmful glare. The effect on visibility applies especially to the working plane and the objects that have to be seen. Brightness, on the other hand, is especially important with regard to walls and ceilings where visibility is not the major effect to be achieved but the avoidance of glare, the annoying and disagreeable effects of unevenness of brightness and extreme contrasts, brightness unfavorably placed, etc.

With respect to the placement of brightness it can be readily seen how very important it is that the vanes which are used for varying the placement of light and brightness should be made separately adjustable. This we have done in the construction of our units.

Local Lighting

It is in local lighting, however, that the means for varying the placement of light and brightness have their greatest possibilities. Here it is easier to place the light where it is wanted and with better effect. One very important effect is that it is possible, in the designing of local lighting units, practically to eliminate glare from the working surface without undue loss of luminous efficiency, by combining in the construction of the housing an intensity control, and a means for varying the direction and placement of light on the work. These effects have been accomplished by us in a bed reading lamp,[5] a desk or table lamp, and a floorstand lamp.

Intensity of Light

The optimum intensity of light varies widely for different people; also it varies with the kind of light used, the range of toleration for intensity of light being much greater for daylight than for artificial light. If too little light is used low visibility results, and if too much is used the excessively harmful effects of glare are experienced.

In tests on 550 people, 100 of each decade age group from 10 to 60 years and 50 above 60 years, we have determined the amount of light preferred for reading 10-point type, the upper and lower limits of intensity for comfortable reading, and the range of amount of light that could be used with comfort. The cases included high school, normal school and college students and faculty, industrial and clerical workers, nonpathologic clinic patients, visitors to the laboratory, etc. In taking the test the subject wore the glasses usually used for reading. No special attempt was made to verify the accuracy of the distance correction and the strength of reading glasses worn because it was thought that in this way a better sampling of the population could be made with respect to its actual working conditions. Space will be taken here for only a brief statement of the results.

The Preferred Amount of Light

The tests showed that around 70 percent of those tested preferred less than 15 foot-candles (ft-c) for reading 10-point type and 50 percent less than 11.3 ft-c. Forty-eight percent preferred between 7 and 12 ft-c inclusive. There is a wide variation of preferred foot-candles for each decade age group and for the group as a whole. A few people preferred a very low intensity, 5 percent preferring less than 4.9 ft-c. In one of these cases the preferred intensity was as low as 1 ft-c and the upper limit for comfortable reading as low as 2.5 ft-c. In certain others the pre-

ferred intensity was 1.5 ft-c and the upper limit 3 ft-c. These cases were not confined to any particular age group. However, they do occur most frequently between 35 and 50 years.

A few people, on the other hand, preferred high values ranging from 20 to above 50 ft-c, 5 percent of the group preferring more than 36.5 ft-c. The cases preferring high amounts of light also were distributed in all age groups, but occurred least frequently between 20 and 30 years. The wide individual variation with respect to the amount of light preferred for reading, even for a single year age group, is a most outstanding and important characteristic of the results obtained, more outstanding and important, for example, than any general trend or group variation. Indeed so strongly marked is this result that light prescribing by individual or group testing should be considered a requirement of hygienic lighting and the safe and comfortable use of the eye. With our variable illuminator and auxiliary equipment the test can be made very easily and requires but little time.

(This instrument is described in "Lamp for the Determination and Measurement of the Preferred Intensity of Light for Reading and for Other Work," Archives of Ophthalmology, 1934, Vol. 12, —. 45–59; "Examination and Care of the Eye in Relation to Lighting," *ibid*, 1937, Vol. 17, pp. 78–103; and "Prescribing Light. An Important Factor in the Care and Treatment of the Eye," British J. Ophthal., 1938, Vol. 22, pp. 641–669. It may be obtained from the American Optical Company and E. B. Meyorowitz Surgical Instruments Company.)

Individual Picks His Own Light

As a still more satisfactory solution to the problem of regulating intensity to suit the needs of the individual, we have devised lighting units provided with a simple mechanical means of varying intensity from high to low without changing the color and composition of the light or the location, size or shape of the illuminated area. These units again comprise a desk and table lamp, a floorstand reading lamp and a bed reading lamp. With them by turning a knob the individual can set the intensity at just the value he may prefer at any time and for any kind of work. So far as we know, it is only in some such way as this that the problem of regulating intensity, to suit the individual case and situation, can be handled with a result that is really completely satisfactory.

Young Eyes

The following additional points may be briefly noted: From 10 to 20 years a tendency is shown to prefer more light than might be expected in young eyes, more for example than is preferred from 20 to 30 years. Possible reasons for this are the characteristically lower sensitivity to glare in eyes in this age group and the generally poorer refractive correction that is found. Also the high mobility

of the pupil of the young eye has an effect; but this effect in relation to the point under consideration is too complicated to be discussed here.

Above 35 years there is a general tendency to prefer more light for reading than below 35 years. This tendency is especially marked in the group of developing presbyopes (35 to 50 years). This is probably due to the fact that in this group the eyes are changing in their refractive condition more rapidly than at any other period of the working life, so rapidly that it is difficult to keep them continuously properly corrected; and a poorly corrected eye, because of the blurred images that are formed on the retina, requires more light for the discrimination of its detail than a properly corrected eye. Also the increased amount of light narrows the pupil which in turn helps to clear up the image.

Older Eyes

However, a surprisingly large number of the developing presbyopes preferred very small amounts of light. This is probably caused by an undue prevalence of an irritable condition of the eyes due to the poor refractive condition. Also during this period a great deal of strain is caused by the rapidly growing disturbance in the relationship between accommodation and convergence, and by other changes and conditions due to the beginning of old age. Until a toleration or adjustment is acquired for these disturbances, as occurs in more established presbyopia, undue irritability and susceptibility to glare are experienced. Strange as it may seem to some, the group above 50 years of age conforms most closely to the total group as to distribution of amount of light preferred for reading. However, it should be remembered that in this group the eye presumably has its refractive errors well corrected and has acquired an adjustment and toleration for the changes that have taken place during the development of presbyopia.

Less Benefit Thru More Light

In connection with the old eye it is a point of interest, too, that while it needs more light as an aid to vision, it receives less benefit to vision through increase of intensity of light than the young or middle-aged eye. In explanation of this the following are some of the possible suggestions. (a) The old eye has a characteristically small and less mobile pupil than the young eye. It therefore does not get as much increase in focusing action through the contraction of the pupil caused by increase of intensity of light, as does the young eye. (b) The retina of the old eye has more lag or inertia in its increase in response to increase of intensity of light than that of the young eye; also its physiological limit of response and the point of diminishing returns are reached at a lower intensity of light. (c) The growing opacity of the media of the old eye causes more and more scatter of light, which interferes with the power to form clear images on the retina. This effect increases with increase of intensity of light. In the early stages in the development of a cataract,

for example, it often becomes so extreme as to render the use of the higher intensities of light intolerable and blinding.

Less Light for Large Pupils

THERE is a decided tendency for those having large pupils to prefer less light, and those having small pupils to prefer more light than the group as a whole, while the preference of those having pupils of medium size is about the same as for the group as a whole. The effect is, however, perhaps less striking than might be expected from the relative amounts of light collected in the image by pupils of different size. The compensating effect of the clearness of imaging given by a small pupil, and the unclearness given by a large pupil must be remembered. An example of this is found in the very small number of those having large pupils, who preferred less than 5 ft-c of light, as compared with those having pupils of medium size.

With respect to the effect of size of pupil on the amount of light preferred for reading, and on the upper and lower limits for comfortable reading, our results show in general that the dominant factor in this effect, on the upper limit, is the amount of light entering the eye; on the lower limit it is the focusing action; and on the preferred amount the two factors are present in more balanced proportion.

Upper Limit for Comfortable Reading

THE results showed that for around 70 percent of the cases the upper limit of intensity for comfortable reading was less the 25 ft-c and for 50 percent less than 17.1 ft-c. As in case of the preferred amount, there was a wide range of individual difference in the upper limit for comfortable reading. A few people had a very low upper limit. For 2 percent it was less than 5 ft-c, for 5 percent less than 7.5 ft-c and for 13 percent less than 10 ft-c. On the other hand, a few had a high upper limit. For 14 percent it was more than 40 ft-c and for 5 percent more than 65 ft-c. Forty-seven percent of the cases had an upper limit between 10 and 20 ft-c.

The concentration of cases between 10 and 20 ft-c was most pronounced for the 20 to 30 year group (66 percent) and least for the 40 to 50 year group (31 percent). In the group of developing presbyopes (35 to 50 years) there was an unusually large number of cases who had very low upper limits of intensity for comfortable reading. The probable reasons for the irritability or intolerance of this group for high intensity of light have already been discussed in the preceding section.

Lower Limit for Comfortable Reading

A VERY important point in the treatment of intensity of light is to know the range over which comfortable reading is possible. This involves a determination for each person of the lower as well as the upper limit of the intensity of light, which can be used with comfort by the eye. This determination, as noted above, was included in our series of experiments on intensity of light.

The results showed that 79 percent require more than 5 ft-c for comfortable reading and 50 percent more than 7 ft-c; also that 50 percent of the cases require between 5 and 9 ft-c. The range of individual difference expressed in foot-candles is in this case very much smaller than for either the preferred amount or the upper limit for comfortable reading. However, a few people required very little light, 5 percent less than 2.4 ft-c; on the other hand, a few required a great deal of light, 5 percent more than 15 but no one more than 20 ft-c. By far the greater number of these latter cases were above 35 years of age. The few in the younger age group who required these higher amounts of light showed by test poor vision.

Range of Light for Comfortable Reading

With respect to the magnitude of the range of amount of light that can be used with comfort in reading, nothing will be said here for the individual case, other than that the difference between individuals is again very great. However, some idea of the magnitude of the range for the group can be had from the middle values respectively of the lower limit for comfortable reading, the preferred amount, and the upper limit. These values are 7.1, 11.3, and 17.1 ft-c.

One of the most important and practical reasons for studying the range of intensity for comfortable reading, is to determine the percentage of cases in which certain of the more commonly recommended foot-candles fall within this range. Results will be given here only for the total group, for the group 10–20 years of age because it is most nearly representative of the school age group, and for the groups below and above 35 years. These results are shown below in tabular form.

GROUP	PERCENTAGE OF CASES IN WHICH CERTAIN OF THE MORE COMMONLY RECOMMENDED FOOT-CANDLES FALL WITHIN THE RANGE FOR COMFORTABLE READING				
	5 ft-c	10 ft-c	15 ft-c	20 ft-c	25 ft-c
Total	20%	68%	55%	38%	28%
10–20 years	21	79	57	44	29
Below 35 years	16	78	49	34	24
Above 35 years	24	60	60	41	31

For the decade groups it will be sufficient to say in general that 10 ft-c falls within the range for comfortable reading, in the highest percentage of cases for all the groups with the exception of 40–50 years, in which case 15 ft-c falls within this range in the highest percentage of cases.

Intensity of Light and Strength of Reading Glasses[6]

Within narrow but significant limits, intensity of light sustains an inverse relationship to the strength of reading glass required in the correction of presbyopic eyes. There are two ways of aiding the presbyopic eye to see its object at the required near distance, namely, a correcting glass and intensity of light. The former of these is a major and the latter a minor or auxiliary aid. However, the

best selection of either can not be made without reference to the other. The preferred procedure is the selection of the optimum combination of intensity of light and strength of glass.

This selection is easy to make when the examiner is provided with the customary trial lenses and a means of varying the intensity of light, such as our Variable Illuminator[7]; that is, the person examined is in no doubt when the most comfortable and satisfactory combination is attained. If for some reason variable intensity of illumination is not available to the person examined, then the selection of strength of glass should be made for the intensity or range of intensities he is compelled to use.

Limiting conditions determining the selection of a combination are on the one hand the discomfort produced by too high an intensity of illumination and on the other the disadvantages of using a stronger correcting glass than is needed. Some of these disadvantages are the greater amount of convergence required with the stronger glass, the less favorable relation between accommodation and convergence, and the undue limitation of the range of distance over which the work can be discriminated. It may be noted here too, that in the early stages of presbyopia, when the refractive condition is changing rapidly, there is an advantage in using all the light than can be tolerated with comfort in that by so doing the correcting glasses will not have to be changed so frequently.

The second part of this paper will appear in the next issue of the PERSONNEL JOURNAL. *The list of references will be included in Part II.*

Personnel Administration has Become Increasingly Scientific in the Last Ten Years, without Correspondingly Improving Industrial Relations. A Suggested Plan that Might Provide a Closer Correlation between These Two.

Decentralize Personnel Work

By W. V. Owen
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Personnel managers of twenty years ago were selected from the shop on a basis of "understanding men." When top management felt the need for establishing contact with employees, industrial relations departments were set up and the task of managing such a department was assigned to a person who became known as the personnel manager. Foremen who had no problems of discipline provided suitable raw material for good personnel men. A promoted ex-foreman did not pass through a course of training; he merely put on his "Sunday Suit" on Monday morning and took his post in an improvised office as personnel manager.

A Man Not an Office

He was a pioneer, which meant that he was forced to develop his own methods. He was on trial; his old colleagues, the foremen, were sometimes unwilling to allow interference their prerogatives of hiring and firing. His job depended on "getting along with people." Soon, everyone in the shop (if the shop was not too big) knew the personnel manager by his first name, and referred to him as "Charlie" or "Bill." Workers with grievances were told to see "Charlie," rather than told to report to the personnel office.

There were few trade agreements to which the personnel manager could refer for guidance in settling disputes. He was forced to use his ingenuity in solving his problems. The fact that he "knew" the men with whom he was dealing was a great boon in the promotion of industrial peace. "Cases" were in the form of human beings, and not records. He was a one-man board of arbitration who could

be trusted with incriminating evidence. His advice was sought concerning all manner of problems which were outside the scope of employment. In short, he was unscientific.

Loses Direct Contact

THE first World War, and the subsequent brief period of prosperity provided ideal soil for the growth of this new organism; so, as business institutions expanded, the duties of the personnel manager became more complex. It was no longer possible to "know" the men and the foremen. The knowledge, which had been the personal property of the personnel manager, was now obtained by his interviewers, who made a record of each "case", which was placed on file.

The manager of men was becoming a manager of records. Reports of labor turnover had to be drawn up, as well as reports of the meetings of the shop council. Welfare programs were organized and administered; the company paper had to be edited. Thus, the old personnel man gradually became an executive who worked with curves, charts, figures and words, rather than with human emotions.

This process of management based on system and science had only begun in the middle twenties. Scientists had been working behind academic walls constructing whole batteries of scientific tools which are now in the hands of personnel managers. Tests of skills, intelligence and attitudes, as well as rating scales were being produced by industrial psychologists. Furthermore, the employment of thousands of persons under one management provided a fertile field for the statistician. Books on personnel management now contain a chapter on statistical methods, and these statistical methods have become a definite part of the equipment of the personnel expert of today.

Now Deals with Legislation and Unions

THE Social Security Act, the National Labor Relations Act and the Fair Labor Standards Act have added more duties to the personnel specialist. He functions, both as an agent of the government in making out the required reports, and also as an agent of top management in interpreting government legislation, as it applies to a particular firm. Owners of firms may look to personnel officers for advice as to coverage, and here any wrong advice as to coverage may prove very costly. Violations of the N.L.R.B. which may invite annoying investigations have created a quasi legal responsibility which must be discharged by the busy personnel executive.

So, it would seem that the old "dressed up" foreman who "understood men" is supplanted by a person who has been trained in economics, political science, psychology, statistics and law. He has become an executive in charge of a variety of "relationships", with his firm on one end, while on the other are to be found labor (organized and unorganized), State administrators armed with State laws, and Federal administrators with their Federal laws.

Almost without warning the field of labor management finds itself engaged in research, collective bargaining, the selling of the State's social reform to employers and the firm's policies to the State in addition to all the ordinary duties of hiring, promotion, safety, etc. That one person can be proficient in discharging all the functions of a present day personnel office is improbable.

Now a Coordinator

BECAUSE of the complexities of modern labor relations, a personnel man with the necessary capacity becomes of necessity a coordinator. By division of labor he delegates authority to his subordinates. Thus, he becomes further removed from the workers and may very probably take on the coloring of management rather than of men. Another possibility is that labor management may become involved in research.

Research in industrial relations may have one of many motives, such as discovering means of reducing labor costs, the truth for the sake of truth, or the promotion of the welfare of the workers. Research may result in the conclusion that management is paying a wage less than the value of labor's product. Will the scholar in industrial relations, who discovers exploitation on the part of his employer, be able to convince his employer that wages should be raised? Is industry interested in discovering its social responsibilities, and is industry willing to pay a scholar for showing industry how to discharge its social responsibilities?

Personnel officers may be forced to think of their own security as well as that of employees. The gravest possibility is that personnel management may degenerate into mere office routine of reporting and record keeping. Record keeping may offer the utmost in job security to the personnel worker, but the least in the development of labor management.

Despite the fact that the old industrial relations specialist was unscientific, he did perform a very necessary function. He provided "ears" which would listen and *not record* the woes of workers. It is doubtful that trade unions furnish the "ears" which modern personnel management has lost.

How to Restore Personal Touch

THE listening function could, however, be restored by reorganizing the personnel department. Such reorganization would consist of setting up several "branch personnel offices" within a plant. Each sub-division would serve no more than a few hundred employees. In this way the old "personal touch" could be restored. Centralized record keeping need not be disturbed.

It would not only be possible to restore the lost personal element, but considerable simplification of the tasks of each "branch office" could be realized by assigning each branch to a group of shops. One office would have jurisdiction over foundry workers, another, over the machine shop, etc. Quite obviously, there wouldn't

be the same number of workers in each division, and adjustments would have to be made.

The division of functions as between the central office and the "branch offices" would be determined by experience. Perhaps record keeping should be confined to the central office, while skeleton cards containing but little detailed information would be filed in the branches. It might be desirable to have the central office select workers, which would obviate the objection of having applicants walk through the plant to the regional offices. In general, the chief functions of the outlying offices would be: to carry out the policies formulated in the central office, to provide "ears" for complaints, and to advise the central office.

Cannot Do It with Foremen

IT HAS been suggested that the personal touch lost by the complexities of system and science and the increase in the number of employees can be restored by the foremen. This doesn't seem feasible for at least two reasons. In the first place, it would be unwise to add to the burden of foremen, whose tasks are already very difficult. In the second place, a foreman is the immediate "boss" and it is very doubtful that a worker would feel free to confide in his "Boss".

Furthermore, the task of informing workmen as to their rights under the Social Security Act, the Labor Relations Act and the Fair Labor Standards Act requires the services of a specialist. It would be unreasonable to expect a foreman to have the knowledge necessary to inform a worker concerning his unemployment insurance benefits, old age benefits, etc.

If it is possible, and apparently it is, for a large business corporation with widely separated production units, to have a central personnel office which functions through the plant offices, why isn't it reasonable to apply the same plan to a large producing unit, which has outgrown its centralized industrial relations office?

There is No Doubt that Distribution, or at Least Retailing, Had a Bad Start, in the Attitude of the Public toward It, and All Retailing Still Suffers. But It is Now Becoming Respectable, Not only in Fact, but Also by Reputation.

Chain Stores Improve Policies

By Joseph H. Berger
Madison, Conn.

I suppose we can admit that the general public regards with little favor the conditions of employment in a chain store. The girl in the '5 and 10' is the butt of much amusement and the subject of not a little pity. If this general impression is based on fact, the chain store system can survive only if its employment policies are brought into line with current demands, a process which can more happily be brought about by voluntary action on the part of management than by ultimate compulsion through public opinion or legislation.

If, on the other hand, the impression is an unjust one and is contradicted by the facts, one is forced to the conclusion that there is an active need for a dynamic public relations policy designed to inform the public of the actual conditions.

In England much the same situation existed a few years ago, but chain store management grappled with the problem, and to-day employment in a chain store is at least regarded as a dignified and worthwhile position to hold.

Better Conditions Bring Better Workers

The unsatisfied and generally incompetent salesgirl, whose employment was essentially transient, has given way to a person of intelligence and training whose conditions of employment and future prospects are fully as high as those of any other distributive worker; so far is this true that in many towns the chain stores attract to their employment the very best of the youngsters who leave school each year.

The directors of the large chain groups are fully alive to the necessity of telling the public what improvements in working conditions they have effected, and one

has only to read the annual speeches of the chairmen, as given to their stockholders and fully reported in the press, to realise how thoroughly the public is kept informed of their personnel policies. In addition, local public relations bulletins are published from time to time in the various towns where chain stores have their branches, and educational and civic authorities are ceaselessly kept aware of the continually advancing personnel policies.

Recent Improvements

WAGES and hours of working are improved every year in the majority of cases, and the basic 40 hour or 44 hour week is made to apply, not only to the counter assistants, but right through all ranks of the staff to the managers and assistant managers. Vacations with full pay are given to all employes, generally on the basis of two weeks to sales assistants, two-and-a-half weeks to floorwalkers and clerical staff, and three to four weeks to managers; in addition, long week-ends are allowed as vacations with pay during the slack periods after the busy and harassing Xmas and summer seasons. Full or partial pay during absence caused through sickness is given as a matter of right, and not as a privilege; despite this, the incidence of such absences remains as low, and in some cases, lower, than in organizations where sickness pay is only allowed in special cases of old and privileged employes.

In the majority of chains, employes are allowed to make their personal purchases from the store at a discount below the standard prices; this has been found to be a very welcome institution, particularly in those cases where the discount is actually paid to the employe in cash at the end of each month. The record-keeping involved is but little greater than what is required for any staff purchase system.

Dismissal Policies Improved

MOST chains have found that it is the interest of their businesses to keep their labor turnover down to a minimum, for clearly the established and trained assistant is of more value than the transient. In order to assist in this, dismissal policies have been so organized that local managers have no power to dismiss employes, except for dishonesty or flagrant insubordination, until the proposed dismissal has been adequately considered both by the district manager and by the area personnel office. Where dismissal becomes necessary through no fault of the employe concerned, it is customary for dismissal compensation to be paid, generally at the rate of one week's wages for each completed year of service.

The physical surroundings of chain store workers have been improved out of all recognition during the last ten years; modern cloakrooms and toilets have been provided, and most stores which employ more than 30 persons have installed comfortable lounges and rest-rooms. These rooms are also used as training schools for salesmanship and display during the hours when they are not required for other use by the staff.

Many firms have elaborated useful schemes for assisting their employes to obtain preventive and curative treatment for sickness, these schemes being worked out with the local hospitals, doctors and dentists so as to secure the necessary services at a cost within the means of the employes.

Transfers and Promotions

SPECIAL consideration is given to those members of the staff who desire to be transferred to stores nearer to their homes than the one at which they are working, and training courses are constantly held, not only for the purpose of helping the employes to improve their standards of efficiency in their existing positions, but also to help them qualify for the senior positions which become vacant from time to time.

Apart altogether from labor union representation, (which is still in the early stages of its development), most chains arrange for a person to be chosen by the staff in each store so as to represent them in discussing personnel policy with the management, and this person necessarily acts as a two-way channel for personal communications between the management and the rank-and-file.

Local and general conferences of these staff representatives meet periodically, and their discussions have helped materially in straightening out human problems which would otherwise be too remote from the home office to be fully appreciated.

Travelling Staffs

SOME chains have developed a series of mobile or travelling staffs, composed of the most efficient salesgirls and other grades, and these mobile staffs are sent from store to store within a given area, both as a routine matter of improving service at the stores to which they are sent for temporary service, and as a special re-inforcement during rush or special reasons. Positions on the mobile staffs are eagerly sought after, for they involve higher pay and privileges as well as the opportunity for getting away from everday surroundings.

Pensions schemes are becoming more and more of an established practice for male employes, the schemes being operated on a contributory basis. The employe, whether manager, assistant manager or stockman, contributes around 4% of his pay, and the employer makes up the difference, (approximately 6% of the payroll of those participating), so as to secure a pension on retirement at age 60 of a monthly check approximating 40% of the average wages earned during the period of employment.

Pensions schemes generally include the right to a lump sum in the event of the employe's death before retirement age, and the return of all his contributions if he should leave his job before retirement. Very few firms have found it possible to operate a pensions scheme for their female employes, because so few of them can ordinarily be expected to continue working until retirement age, but in many cases

special funds for women employes are set up, with the object of providing pensions or substantial lump sums for those who remain with the firm for many years.

Voluntary Action by Managements

THE introduction of these and other advances in working conditions for chain store employes has necessarily led to the recruitment of a higher calibre of worker than was formerly the case, and management reaps its benefits, not only in improved sales arising from the greater knowledgeability of the employes, but also in reduced shortages and other controllable expenses. In addition, the standard of conduct in the stores has improved very considerably, and an atmosphere of harmony and goodfellowship has succeeded the former harshness and discordance.

Not the least interesting fact is that all these developments have come about from the voluntary action of chain store managements up and down the country, for it is they who have been far-sighted enough to understand that the merits of the chain store system depend not only upon the value of the merchandise which they sell, but also upon the living standards of the hundreds of thousands of workers whom they employ.

Industrial Health Agency Directory

By W. J. McConnell, M.D.

Industrial Health Agencies, and their reports and studies, were described in the March, 1940, Personnel Journal.

To aid companies who might wish to seek advice or assistance from these agencies on special problems, or to keep in continuing touch with their work, Dr McConnell has kindly provided the following directory:

Mr. H. B. Meller, Managing Director
Air Hygiene Foundation of America, Inc.
4400 Fifth Avenue
Pittsburgh, Pennsylvania
Dr. McIver Woody, Medical Director
Standard Oil Company of New Jersey
30 Rockefeller Plaza
New York, N. Y.
(President, American Association of Industrial Physicians and Surgeons)
American College of Surgeons
40 East Erie Street
Chicago, Illinois
Dr. C. M. Peterson, Secretary
Council on Industrial Health
The American Medical Association
535 North Dearborn Street
Chicago, Illinois
Dr. Harold S. Diehl, Chairman
Section on Preventive and Industrial Medicine and Public Health
The American Medical Association
535 North Dearborn Street
Chicago, Illinois
Mr. J. J. Bloomfield, Sanitary Engineer
Industrial Hygiene Division
National Institute of Health
U. S. Public Health Service
Bethesda, Maryland
(Secretary, Industrial Hygiene Section, American Public Health Association)
Dr. R. J. Atwater, Executive Secretary
American Public Health Association
50 West 50th Street
New York, N. Y.
Mr. A. V. Hutchinson, Secretary
American Society of Heating and Ventilating Engineers
50 Madison Avenue
New York, N. Y.
Mr. F. C. Houghten, Director
Research Laboratory
American Society of Heating and Ventilating Engineers

4800 Forbes Street
Pittsburgh, Pennsylvania
Mr. L. A. Harding, Chairman
Joint Committee of the American Society of Heating and Ventilating Engineers and American Society of Refrigerating Engineers on Minimum Requirements for Comfort Air Conditioning
American Society of Refrigerating Engineers
New York, N. Y.
Mr. David L. Fiske, Executive Secretary
American Society of Refrigerating Engineers
37 West 39th Street
New York, N. Y.
Mr. Cyril Ainsworth, Secretary
Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases
American Standards Association
29 West 39th Street
New York, N. Y.
(Also Assistant Secretary, American Standards Association)
Mr. H. B. Dates, Chairman
Technical Committee on Lighting of Factories, Offices, Schools and Other Work Places
Illuminating Engineering Society
3071 Euclid Heights Boulevard
Cleveland, Ohio
Mr. W. H. Cameron, Managing Director
National Safety Council
20 North Wacker Drive
Chicago, Illinois
Dr. Charles J. Hatfield, Secretary
National Tuberculosis Association
50 West 50th Street
New York, N. Y.
Dr. Leroy U. Gardner, Director
Saranac Laboratory for the Study of Tuberculosis
7 Church Street
Saranac Lake, New York
Dr. Carey P. McCord, Director
Industrial Health Conservancy Laboratories
10 Peterboro Street
Detroit, Michigan
Mr. E. O. Jones, Director
Safety and Hygiene Section
American Foundrymen's Association
222 West Adams Street
Chicago, Illinois
(Treasurer, Industrial Hygiene Codes Committee)
Dr. Donald M. Shafer, Associate Consultant
Committee on Healthful Working Conditions
National Association of Manufacturers
14 West 49th Street
New York, N. Y.
Mr. A. R. Curtis, Secretary
Committee on Accident Prevention and Insurance

Portland Cement Association
33 West Grand Avenue
Chicago, Illinois
Dr. John Foulger, Director
Haskell Laboratory of Industrial Toxicology
Wilmington, Delaware
Dr. A. G. Cranch, Director
Industrial Toxicology Department
Union Carbon & Carbide Company
30 East 42nd Street
New York, N. Y.
Dr. Leverett D. Bristol, Health Director
American Telephone & Telegraph Company
195 Broadway
New York, N. Y.
Dr. George M. Price, Director
Union Health Centre
275 Seventh Avenue
New York, N. Y.

Employee Publication Editors Meet

By Robert F. Stone

The American Association of Industrial Editors, a National Association for Employee Publication Editors, recently held its first annual convention in Cincinnati, Ohio.

The growing importance of employee publications in the sphere of employer-employee and public relations was stressed by Bennett Chapple, assistant to the president, American Rolling Mill Company, in his address before 70 employee publication editors at their banquet.

"Editors of employee publications," said Mr. Chapple, "have a big job on their hands if they live up to their opportunities. These publications are the natural voice of business and should be the first to reveal mutual interest in all those things that go to make up successful industries. Business problems must be better understood, not only by the general public, but by the wage earner to whose life work they are a vital concern.

"There is an average of $7,600. in invested capital behind every job in the country," Mr. Chapple continued. "In the iron and steel industry the figure is $11,500.

"America needs an awakening to these things and the editors of employee publications should start the awakening. They are the family men of industry."

Technical Sessions on Layout, etc.

The Monday afternoon session included talks by Fred Toy, Cincinnati Gas & Electric Company, who pointed out the relative value of certain types of pictures and the paramount necessity of pictures in making an employee publication effective. William Dowdell, city editor of the Cincinnati Post, demonstrated some of the methods of gathering news. Mr C. John Morean of the Crowell-Collier Publishing Company spoke on effective layout and typography. Rudolph J. Bartz of the Caterpillar Tractor Company illustrated his talk, on making the employee publication interesting to the reader, with selected examples of both good and bad layout, typography and editorial policy.

The Tuesday morning session included talks on "What the Employee Publication Should Contain" by Marvin Alexander of Scott Paper Company; "Editorial Content and Management Articles" by Howard Marple of Monsanto Chemical Company; "Contributions of Employee Publications to Education for Morale Building" by Professor Ralph C. Davis of Ohio State University; "Management's View of Employee Publications" by Dr. F. G. Barr, Supervisor of Industrial Relations, The National Cash Register Company.

"The housewife can be a strong factor in creating amicable relations between employers and employees," said Mrs. Betty Barton, Radio Director for the National Legion of Mothers of America, who addressed the Tuesday luncheon session on "The Woman's Angle in Employee Publications." "Women in the home do more than is generally realized to influence the attitude of their husbands and sons towards their jobs." In concluding, Mrs. Barton strongly advised that material used in company and employee magazines be directed towards housewives also.

Officers

OFFICERS for the coming year include:

President—L. O. Cheever, John Morrell & Co.
Secretary—Sadie Rodgers, State Farm Insurance Companies
Treasurer—Kenneth L. Ede, Ohio Public Service Company
Vice-Presidents—
John Kemps, American Enka Corporation
C. L. Jackson, Acme Steel Company
Rudolph J. Bartz, Caterpillar Tractor Company
W. H. Senyard, Louisiana Light & Power Company
Howard A. Marple, Monsanto Chemical Company
F. L. Cheever, Pepperell Manufacturing Company
Marvin Alexander, Scott Paper Company
Bert Barnes, United Parcel Service
John B. Meagher, Weirton Steel Company
Fred Toy, Cincinnati Gas & Electric Company

Robert F. Stone was re-appointed to serve as Executive Secretary for the coming year. Mr. Stone would be glad to have all those actively concerned in such editorial work get in touch with him, to learn the activities of the Association, receive notices of its conventions and about membership in it.

His address at the headquarters of the Association is, 3732 Euclid Avenue, Cleveland, O.

Book Reviews

Book Review Editor, Mr. Everett Van Every
University of California, Berkeley, Cal.

WAGE SETTING BASED ON JOB ANALYSIS AND EVALUATION

By C. Canby Balderston. New York: Industrial Relations Counselors, Inc., 1940, 70 pp.: $1.00

In this monograph the author deals with what is perhaps one of the most pressing and basic problems in many American companies—the need for more logical wage structures. Governmental measures for the regulation of wages, the extension of wage negotiations through collective bargaining and growing dissatisfaction of employees over wage discrimination are now prompting employers to improve wage and salary administration. Job analysis, a systematic means of evaluating jobs and determining rates, is being resorted to as a substitute for the former hit-and-miss methods.

Professor Balderston here reviews the different techniques of job analysis and appraises them in terms of good industrial relations policy. After dealing with definitions and descriptions of procedures, he discusses the problems involved in planning a job analysis project, the actual steps necessary to an analysis of both hourly-rated and salaried work and the application of the rate schedule growing out of an analysis project. Finally, he considers certain limitations on the use of job analysis at the present stage of its development.

Business executives and students of labor problems, who believe with Professor Balderston that systematic wage setting is the starting point of good industrial relations policy, will find this monograph a valuable contribution to constructive planning and action.

THE STRATEGY OF JOB-FINDING

By George E. Lyons and Harmon C. Martin. New York: Prentice-Hall, Inc., 1939, 408 pp.: $3.50

Reviewed by Book Review Editor

Among the "must" books in a personnel manager's library should be one on current-day techniques in job-finding. With so much emphasis today on unemployment, and the many plans for reducing it, the employment offices are experiencing a barrage of applicants in the many stages of preparation and qualifications for a job.

"The Strategy of Job-Finding" is a business book for the job-seeker. More specifically it is recommended to the recent graduate who wants to seek out his job career, and conduct a systematic plan of campaign among employers. In this era

of job displacement and occasional dismissals, such a book might well serve the personnel manager or supervisor to relieve the sting of the lay-off.

The authors treat the selection of a vocation; interviewing techniques, employment practices and the elements of a job-finding campaign. Counselors and placement officers in schools and universities should find this volume a ready desk source of ideas and suggestions; adult groups, evening courses, community job clinics, reemployment projects and vocational classes could readily use this book as a foundation text; and the industrial personnel and employment manager will want to know what these groups are doing about winning his favor and how best to cooperate with the deserving applicant who is making an intelligent approach to his job-seeking problem.

SECRETARIAL EFFICIENCY

Frances Avery Faunce and Frederick G. Nichols. New York: Whittlesey House, McGraw-Hill Book Company, 1939, 601 pp.: $3.50

Reviewed by Grace Rieneman

"*Secretarial Efficiency*", says the author, "is written for secretaries by a secretary with the desire to show how each duty may be carried through by itself with efficiency and poise, and to give assurance in the ways of handling many duties at once with equal efficiency and poise."

The author presents a wealth of practical material, emphasizing the fundamental principles and reasons underlying the use of this factual knowledge. It is her purpose to provide a textbook for students as well as a handbook for experienced secretaries. Her first purpose is well attained, but the experienced secretary may find this wealth of factual material a maze of elementary details.

This book could be heartily recommended to the struggling stenographer who has not had the advantage of a complete secretarial training, or to the secretarial school graduate just starting her career. The chapter on the proper procedure for obtaining a position is one of the most valuable in the book, and could perhaps have been even more detailed for the benefit of the beginner.

Personnel directors, office managers and supervisors will find this volume a good source book for staff reading, and for standardizing office and secretarial practice.

PERSONNEL ADMINISTRATION IN THREE NON-TEACHING SERVICES OF THE PUBLIC SCHOOLS

Hazel Davis. Contributions to Education, No. 784. Bureau of Publications, Teachers' College, Columbia University, New York, 1939.

Pp. XII + 323: $2.50

Reviewed by T. L. McCuen, Business Manager, Kern County Union High School District, Bakersfield

The subject of personnel administration should be of interest to school administrators, particularly the forgotten phases of personnel administration in non-teaching services.

The general program chosen for study in this work was to determine whether or not approved personnel procedures in administration tend to be associated with evidences of adequate performances in the non-teaching services of attendance, school nursing, and secretarial work. The author in conducting this investigation under the supervision of George D. Strayer visited twelve cities with a range in population of from thirty thousand to one hundred and fifty thousand in the vicinity of New York City.

Data for the survey were gathered by personal observation of practices, check lists and interviews. The observations showed that the systems which were above the average in carrying out the proposed principles of personnel administration tended also to be above the average in performance of certain aspects of three non-teaching services of the schools. In no one of the cities studied was there evidence of a comprehensive program of personnel administration.

The study reveals that little direct attention was being given to the administration of the non-teaching personnel and lists the following three causes which appear to contribute to this neglect: (1) the inadequate staff assistance available to superintendents; (2) the failure of superintendents to conceive of a broad program of personnel administration as one of their professional responsibilities; and (3) the absence of research on certain crucial phases of personnel administration.

The author points out that progress is being made in certain specific areas of service but not with the school staff as a whole. Twenty-one guiding principles or measures of personnel administration are proposed and might well serve as a guide to any school administrator in improving his own personnel administration.

The descriptions of best practice observed in connection with the various principles, reveal that even at best the personnel procedures are limited in scope. One might feel that the school units included in the study are too limited in number and too localized to warrant general conclusions on personnel practices in all areas. The general principles developed, however, are sound. An extensive bibliography on personnel administration is included at the close of the study.